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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/611,037	07/06/2000	Andras Kuthi	LAM1P077A	5329

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EXAMINER

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ART UNIT PAPER NUMBER

1763

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5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/611,037	Applicant(s) KUTHI ET AL.	
	Examiner Luz L. Alejandro	Art Unit 1763	

AS-5

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 7/6/00 (pre-amendment B).

2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 14-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 14-21 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____

4) ☐ Interview Summary (PTO-413) Paper No(s). _____

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: reference number 256, see page 12-line 14. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: reference number 130 (see fig. 1D). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "140" has been used to designate both a cross sectional view (see page 4-line 1, and fig. 1E) and a dielectric layer (see page 4-line 2, and fig. 1E). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The abstract of the disclosure is objected to because it contains more than 150 words. Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 112

Claims 14-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The preamble of claim 14 is confusing since as claimed the method for making a top electrode for the chamber is performed in a chamber for processing a semiconductor wafer. Instead, it appears that the top electrode, made by the claimed method, is used in the chamber for processing the semiconductor wafer. Clarification is required.

Claim 14 recites the limitation "the system" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claims 15, 18, and 20-21 are unclear because the claimed limitations are not directed to a method for making the electrode as required by the preamble, but instead are directed to either a method of using the electrode in the plasma chamber and/or a method of operating the plasma chamber in which the electrode is being used.

Clarification is required.

The term "at least about" in claim 16-line 3 is a relative term which renders the claim indefinite. The term "at least about" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Degner et al., U.S. Patent 5,074,456 in view of Chang et al., U.S. Patent 4,854,263.

Degner et al. shows the invention substantially as claimed including an electrode 10 formed with a center region, a first surface 80 and a second surface 12 (see fig. 4), the first surface having an inlet 86 that is configured to receive processing gases from a source 70 that is external to the system 50 (see fig. 3) and flows the processing gases into the center region wherein a pair of baffle plates 87, 88 are inserted, and wherein the second surface has a plurality of gas feed holes 16 (see figs. 3-4 and col. 8, lines 27-39).

Degner et al. does not expressly disclose that the electrode is formed to have gas feed holes that lead to a plurality of electrode openings, the electrode openings having diameters that are greater than gas feed hole diameters of the plurality of gas feed holes. Chang et al. discloses an electrode which has been formed as to comprise gas feed holes 33 that lead to a plurality of electrode openings 31, the electrode openings having diameters that are greater than gas feed hole diameters of the plurality of gas feed holes (see figs. 1-3), in order to enhance dissociation and reactivity of the gas(es), see col. 5, lines 33-53. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the electrode disclosed by Degner et al. as to comprise the gas feed holes that lead to a plurality of electrode openings, the electrode openings having diameters that are greater than gas

Art Unit: 1763

feed hole diameters of the plurality of gas feed holes, in order to enhance dissociation and reactivity of the gas(es).

With respect to claims 16-17, Degner et al. and Chang et al. do not expressly disclose that the gas feed holes have a diameter of about 0.1 mm and the electrode openings have a depth of about 1/32 to 1/4 of an inch, but it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize through routine experimentation the gas feed hole diameter and the electrode opening depth, depending upon, for instance, the particular size of the semiconductor wafer being processed, and therefore the claimed dimensions would not lend patentability to the instant invention absent a showing of unexpected results. Furthermore, with respect to the diameter of the electrode opening, note that Chang et al. further discloses an example in which the electrode openings are formed to be 4.75 mm which is greater than 0.5 mm, see figs. 2-3 and col. 6, line 26 ($d_2 = 190$ mils).

With respect to claims 15, 18 and 20-21, such limitations are not directed to a method for making the electrode, but instead are directed to either a method of using the electrode in the plasma chamber and/or the method of operating the plasma chamber. Therefore, such limitations do not further limit and/or do not patentably distinguish the claimed invention. Furthermore, this notwithstanding, note that with respect to claim 15, Degner et al. discloses a plasma chamber in which RF power is coupled to both the top electrode and the wafer support (see fig. 3). With respect to claim 18, note that Degner et al. discloses that the gap between the exposed surface 12 of the electrode and the lower electrode 58 can be adjusted by raising and/or lowering


the upper structure 59 of the top electrode (see col. 7, lines 21-30), and Chang et al. discloses an electrode separation of 0.762 cm (300 mils), see table 1. With respect to claim 20, it is inherent that a second plasma sheath that outlines an inner region of the electrode openings of the top electrode disclosed by Degner et al. and Chang et al., will form due to the dimensions of the electrode openings, as stated by applicants in page 13, lines 22-24 of the specification of the instant application. Also, with respect to claim 21, note that Chang et al., in page 7, lines 16-19, discloses the claimed limitation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.


Luz L. Alejandro
Patent Examiner
Art Unit 1763

February 25, 2002